METHODS AND APPARATUS FOR CONNECTING FAMILY MEMBERS

FIELD OF THE INVENTION

The present invention is directed to communications systems and, more particularly, to routines and apparatus for allowing groups of individuals, e.g., family members, to communicate with one another, e.g., in times of emergency.

BACKGROUND OF THE INVENTION

During times of national tragedy, or during a family emergency, knowing about the safety and location of family members and close friends can be very important. Talking to family members, or even just hearing their voices, can provide comfort in those anxious times. Since emergency situations may occur at any time, it is likely that family members may be scattered in different locations making it hard for them to communicate with each other. For example, at the time of an emergency, parents may be away from home, e.g., at work, while the children are off visiting friends. No one may be at home at the family residence, e.g., house, to answer calls and relay information.

Various call forwarding services are available that can forward calls from one location, e.g., a family residence, to another location where a person is

temporally located. Such forwarding services may include a call screening feature which limits call forwarding, e.g., to calls from telephone numbers on a subscriber provided list or who have provided a particular personal

5   identification number (PIN). Such call forwarding services normally are enabled/disabled by the subscriber.

Such known call forwarding services fail to provide a way for connecting multiple, e.g., 3 or more,

10   family members at different locations together in a single call. Such conference calls are particularly desirable in times of emergency where several, e.g., 3 or more, family members may want to share information.

15   Wireless telephones offer one method for contacting individual family members when they are away from home. Unfortunately, during times of emergency, e.g., national disaster, mobile phones suffer from several limitations. For example, during a disaster

20   there tends to be a flood of wireless calls to/from the region where the disaster occurred. This creates service availability issues, e.g., wireless calls may not go through due to congestion of the wireless telephone networks. Physical destruction of wireless telephone

25   transmitters in a disaster region may also present problems when attempting to contact family members via wireless phone in a disaster area. Accordingly, it may not be possible to contact individual family members via wireless phone during a disaster.

Even when a family member can be contacted by wireless phone, it is often not easy to conference in other family members as part of a multi-call telephone conference. Accordingly, even when an individual family member can be reached by wireless phone, it can often be difficult to quickly disseminate the information about the individual's status to all family members.

E-mail offers an alternative means of communicating during an emergency. While E-mail is becoming more common, it is still rare for every member of a family to have ready access to E-mail, particularly when away from home. Many E-mail users still rely on dial-up connections to access their E-mail. Such E-mail users may be reluctant to tie up their telephone lines during emergencies in fear of missing a call from a loved one. However, for users of mobile E-mail devices, e.g., personal data assistants (PDAs) and notebook computers with wireless E-mail capability, E-mail presents a useful way of exchanging at least some limited information during an emergency.

In the uncertain world of modern times, there is a need for a way of establishing communications between multiple family members during times of an emergency or disaster. Accordingly, there is a need for methods whereby family members who are away from home can easily exchange information with one another. It is

desirable that any such method not be dependent on the need for an individual to have or use a mobile phone. It is also desirable that any such methods not be dependent on the ability of family members to transmit and/or

5   receive E-mails. While it is desirable that an emergency communications service not be dependent on mobile telephone and/or E-mail use, when available it would be beneficial if such communications methods could be used to exchange at least a limited amount of information.

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From a practical standpoint, it is desirable that a method of allowing family members to communicate with one another in an emergency be capable of being implemented whether or not one or more family members are

15 at home at the time of the emergency situation. It is also desirable that the communication method allow and/or provide for telephone conference calls between multiple family members so that a large number of family members can obtain information about the other members at the

20 same time.

Accordingly, there is a need for new methods and apparatus that can be used to allow members of a family or other group of people to communicate with one

25 another during times of national, family or other types of emergencies.

SUMMARY OF THE INVENTION

The present invention is directed to methods and apparatus which allow groups of individuals, e.g., family members, to communicate with one another even when no one is available to answer a primary telephone number, e.g., a family telephone number, associated with the group.

In accordance with the present invention, a set of information, e.g., a table, is created for each group of individuals using the service. The table for a group, e.g., family, is associated with a primary telephone number, e.g., family telephone number, which is also associated with the group. The table includes a list of members corresponding to the group associated with the primary telephone number. Phone numbers from which the individual group members are likely to call are also stored for identification purposes in the table. A PIN may be associated and stored with each group member for purposes of specifically identifying the group member when calling from a telephone associated with a number which is not listed. Messages in the form of text or recorded voice messages may be included with emergency contact telephone number information in the table.

Family members can access and update the messages and emergency contact information from remote locations using a telephone and/or the Internet. Members

listed in the table may leave general messages intended for all other group members. In addition, or alternatively, they can leave messages for other specific members of the group.

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The present invention can be used to allow group, e.g., family, members to communicate with one another. This service is particularly useful in times of emergency such as local or national disasters, or at
10 other times when no one is available to answer calls to the primary, e.g., family telephone number. In accordance with the invention, when calls made to the primary telephone number, e.g., family residence telephone number go unanswered, the unanswered call is
15 connected to an intelligent peripheral device capable of accessing the family's emergency information table and initiating a conference call to family members.

Calling party information, e.g., the calling
20 party's telephone number and/or a PIN is checked to determine if the calling party is a family member. If the calling party is determined to be a family member, the calling party is presented with messages and a list of family members who have provided emergency contact
25 telephone numbers. The family member is then provided with an opportunity to initiate a conference call to family members listed in the information table. The caller may select to initiate a conference call to all or some of the listed family members. In response to the

family member's selection, the peripheral device initiates calls to the selected individuals using the contact information, e.g., telephone numbers, provided in the information table for emergency contact purposes.

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Since the peripheral device initiates the calls to the selected family members using the contact telephone number information from the emergency contact information table, there is no need for the calling party to dial or otherwise manually initiate individual calls to each of the selected family members.

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When a called party answers a call initiated by the peripheral device as part of a conferencing operation, the peripheral device bridges the answered call with the original call. In this manner, a conference call can be established between two, three or more family members quickly and easily.

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The conference call can be billed to the family telephone number, e.g., as a function of the number of call participants, e.g., as indicated by the number of calls placed by the peripheral device, and the duration of the conference.

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The communications method of the present invention can be implemented in conjunction with existing telephone services. For example, it can be used as a supplement to a conventional call forwarding service,

e.g., by responding to calls to the family home which go unanswered despite call forwarding.

While described in the context of an AIN system which uses an IP as a conference bridge, the service may be implemented using a variety of telephony devices with call initiation and conferencing capability.

Various additional features and advantages of the present invention will be apparent from the detailed description which follows.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates a communication system implemented in accordance with an exemplary embodiment of the present invention.

Fig. 2 and Fig. 3 are flow diagrams illustrating the steps of exemplary communication information updating methods of the present invention.

Fig. 4 is a flow diagram illustrating an exemplary communication method implemented in accordance with the present invention.

Fig. 5 illustrates an exemplary emergency contact information table, which may be used by any of the methods illustrated in Figs. 2-4.

DETAILED DESCRIPTION

Fig. 1 illustrates a communication system 100
implemented in accordance with an exemplary embodiment of
the present invention. The system 100 includes routines,
call processing logic and hardware for providing the
communications service of the present invention. The
system 100 supports communications via the Internet 30,
as well as the public switched telephone network (PSTN).
The PSTN includes a plurality of signal switching points
(SSPs) 2, 4, 6 which, as is known in the art, may be
implemented using known Class 4 and/or Class 5
telecommunications switches, e.g., telephone switches,
capable of supporting the signaling system seven (SS7)
protocol. Each SSP 2, 4, 6 may correspond to a different
telephone central office. Trunk lines (TLs), which may
comprise, e.g., one or more T1 lines, interconnect the
various SSPs 2, 4, 6. In addition to SSPs 2, 4, 6, the
system 100 includes a mobile telephone switching office
(MTSO) 5 for servicing mobile telephone calls. The calls
may be received via antenna 7. The MTSO 5 is coupled to
one or more SSPs, e.g., SSP 4 via trunk lines. In this
manner, cellular telephone calls can be routed and
processed via an SSP 4 allowing interaction with land
line telephones as is known in the art.

Each SSP 2, 4, 6 is normally connected to one
or more customer premises (CP) which may include, e.g.,

residences and/or offices. In the Fig. 1 example, first and second customer premises 22 and 24 are coupled to the second SSP 4, third customer premises 26 is coupled to the first SSP 2 while the fourth customer premises 28 is

5 coupled to SSP 6. Connections between the SSPs and CPs may be by POTS lines, ISDN lines, DSL, or other known communications lines.

Communications equipment, referred to as

10 customer premise equipment (CPE) is located at each customer premises 22, 24, 26, 28. Customer premise equipment may include, e.g., telephones, faxes, computers, etc. In Fig. 1, a computer 36, land-line telephone 38, and mobile telephone 37 are shown as being

15 located at the first customer premises 22. Since cell phone 37 is a mobile communications device it need not be physically located at the first customer premises to operate. The computer 36, located at the first customer premises 22 is coupled by any one of a plurality of known

20 connection techniques, e.g., telephone dial-up, ISDN, DSL, etc., to the Internet 30, also known as the World Wide Web.

While the second, third and fourth customer

25 premises 26, 28 are illustrated as including only landline phones, it is to be understood that they may have any number of communications devices including, e.g., telephones, faxes, and computer devices.

Additional telephone service subscribers may be coupled
to any one of the SSPs 2, 4, 6.

The system 100 is implemented using advanced
5   intelligent network (AIN) techniques. Accordingly, the
processing of calls directed to a customer's telephone
line and received by an SSP from a telephone customer's
line may be controlled by instructions included in
customer call processing records (CPRs). In the system
10   100, the CPRs are stored at an Integrated Services
Control Point (ISCP) 16. The CPRs may include sequential
contingent call processing instructions in the form of a
next event list (NEL). At least one CPR exists for each
subscriber to an AIN based service. A customer's CPR is
15   accessed in response to activation of an AIN trigger set
at, e.g., the SSP 2, 4, or 6 to which the subscriber's
line or lines are connected, e.g., by POTS lines.

The ISCP 16 includes a network interface (NI)
20   45, a service management system (SMS) 62, data and
reporting system (DRS) 63, service creation environment
(SCE) 60 and an SCP 64. A local network 67 couples the
various components of the ISCP 16 together.

25   The network interface 45 couples the ISCP 16 to
various other components of the telephone network 100 via
a TCP/IP based network referred to as an operational
services network (OSN) 34. The OSN 34 interconnects SSPs
2, 3, 6, the MTSO 5, Intelligent Peripherals (IPs) 18,

10, 20, and the ISCP 16. Thus, the OSN 34 is a network over which control and signaling information can be passed between the various system components, e.g., using TCP/IP. In addition to being connected to the OSN 34,

5   ISCP 16 is connected, via its SCP 64, to the SSPs and MTSO via one or more signal transfer points (STPs) 12 and Signaling System Seven (SS7) interconnects over which messages, data, and requests for call processing control instructions can be communicated between the SSPs 2, 4,

10 6, or MTSO 5 and ISCP 16 in accordance with the SS7 protocol.

The SCP 64 includes a multi-service application platform (MSAP) database 69, which includes customer data

15 (CD) 71 for each of a plurality of other service subscribers. The customer data 71 includes, for each customer: 1) a list of the services to which the customer subscribes; 2) a password which may be input via DTMF signals; 3) a call processing record (CPR) 73 which is

20 used to instruct an SSP how to process a call in response to one or more AIN triggers to thereby implement the services to which the customer subscribes; and 4) an emergencies contact information table (ECIT) 72. Fig. 5 illustrates an exemplary ECIT table. The subscriber's

25 ECIT 72 may be a duplicate of an ECIT 72' stored in the IP 10. In some embodiments the SCP 64 obtains information from the ECIT 72' in the IP 10. The ISCP 16 supports the emergency communications service of the

present invention in addition to other services, e.g., call forwarding, call screening and voice mail.

The customer data 71 which includes one or more call processing records 73 is generated, at least initially, by the SCE 60 in response to input received from a service representative or operator 44. Customer data in the database 71 and the CPR 73 may, after initial provisioning of a service for a customer, be updated by the customer via telephone or via the Internet through the use of a Web browser.

The SCE 60 includes an operator terminal (OT) 49, service order processing circuitry 48 and AIN provisioning system circuitry 46. The operator terminal 49 is used by the service representative 44 to enter service information, e.g., to create a service account for a new subscriber. The entered data may be information, e.g., relating to the addition of a new customer, the adding of a service for an existing customer, and/or the cancellation of a service being provided to an existing customer. The service order processing circuitry 48 is used to generate service orders, e.g., orders to add or cancel a service, in response to service information entered into the operator terminal 49. The AIN provisioning system circuitry 46 is responsible for setting and/or updating AIN triggers at the various signal switching points (SSPs and MTSO) required to implement a service order generated by the

service order processing circuitry 48. In addition to setting AIN triggers, the AIN provisioning system circuitry 46 is responsible for generating and/or updating customer data, e.g., call processing records 73,

5   ECIT 72, 72' and other information stored in various locations in the system 100, as required to implement a service order. As will be discussed below, various IPs 10, 30 are used to provide services to telephone service subscribers. Thus, in addition to updating information

10   in the customer database 71, the AIN provisioning system circuitry is responsible for updating information in the various IPs 10, 30 as required. The updating of the IPs and the setting of AIN triggers can be performed by the AIN provisioning system circuitry 46 through

15   communications with the various system components conducted using the OSN 34 and/or via SS7 links.

Once service to a customer has been initially configured by a service representative 44, a service

20   subscriber, e.g., an emergency communications service subscriber can, in accordance with the present invention, update various service information though the use of a personal computer and a Web Browser application. Known browsers which can be used for this purpose include

25   Internet Explorer, AOL, Netscape, etc.

In the Fig. 1 system, the service subscriber to whom the first customer premises corresponds can update the subscriber's service information, e.g., emergency

contact service information stored in tables 72, 72', via the use of computer 36 and an Internet connection.

The system 100 includes an Internet Customer
Access Server (ICAS) 32. The server 32 serves as a
secure gateway via which emergency communications service
subscribers can update and configure their telephone
service information using a computer coupled to the
Internet. The ICAS 32 includes security routines, e.g.,
a firewall, designed to prevent individuals other than
the subscriber gaining access to and/or modifying via the
Internet, subscriber service information. The ICAS 32
is coupled to the OSN 34 thereby allowing a customer,
upon satisfying various security checks, to access and
modify service information stored in any one of the
various network devices, e.g. ISCP 16, and/or IP 30,
coupled to the OSN 34.

In order to implement various services, such as
the emergency communications service of the invention and
voice mail, intelligent peripheral (IP) devices such as
IPs 30 and 10 are used. The first IP 10 is an
interactive voice response (IVR) IP which is capable of,
and includes circuitry for, performing speech recognition
and/or DTMF signal detection operations as well as
playing voice prompts and other messages to a telephone
service subscriber.

IVR IP 10 is coupled to the first SSP 2 via audio (voice) lines. It is also coupled to the OSN 34 and the Internet 30 through a network interface (NI) 21. The IVR IP 10 may be implemented using known hardware and includes circuitry and/or software for implementing steps of the present invention. This includes circuitry for generating and sending E-mail messages.

The IVR IP 10 serves as a platform by which a telephone service subscriber and/or an individual listed in an ECIT 72, 72' can update his/her information, e.g., contact telephone number and/or E-mail address, through a telephone as opposed to an Internet connection. A telephone service subscriber can establish a service updating or management session with the IVR IP 10, by dialing a telephone number associated with the IVR IP 10. Dialing of the IVR IP's telephone number results in the subscriber's call being routed to SSP 2 and a voice/DTMF connection to the IP 10 being established.

IP 10 includes various security features, e.g., customer identification and password entry requirements, as does the ICAS 32, to insure that telephone customers and individuals listed in ECIT 72, 72' are limited to accessing and updating their own information and not those of other telephone service subscribers. As an additional security measure, upon initial activation, customers may be required to call from their subscribed to telephone. In such an embodiment, the IP 10 will read

the ANI (Automatic Number Identification) of the calling

number and will verify with the ISCP 64 that the caller

is an authorized new user. The IP 10 then requires the

customer to enter a new PIN (Personal Identification

5   Number) to be used for future sessions.

The second IP 30 is a voice mail IP which

provides voice mail service to voice mail telephone

service subscribers. In accordance with one feature of

10   the present invention, voice mail service is provided to

emergency communications service subscribers. However,

voice mail service is not an absolute requirement for

implementing the communication service of the present

invention. A subscriber can access his/her mailbox by

15   calling a telephone number associated with the voice mail

IP. When connected to the voice mail IP, a voice mail

service subscriber can enable/disable voice mail.

Figs. 2 and 3 illustrate methods for updating

20   and/or checking emergency contact information. As

mentioned earlier, family members can update and/or check

emergency contact information tables over the Internet or

using a telephone. As part of the update process, they

can add/delete family members to/from the table. Fig. 2,

25   which comprises the combination of Fig. 2A and Fig. 2B,

illustrates the steps of an exemplary method 200

performed by the ICAS 32 for updating and/or checking the

content of emergency contact information table (ECIT) 72'

via the Internet.

Exemplary method 200 starts in step 202 with the ICAS 32 monitoring for input from the Internet 30. Data used to initiate an ICAS session 204 is transmitted

5   from a subscriber's computer over the Internet 30 to the ICAS 32. In step 206 the data transmitted via the Internet 30 is received by the ICAS 32. Next, in step 208, ICAS 32 transmits a login prompt and/or screen to the subscriber. In step 212, the subscriber is verified

10 once subscriber login information 210 is received.

In step 214, the subscriber is presented with a number of service options including, e.g., updating emergency contact information. In step 218, information

15 216 indicating selection of the emergency contact information update option is received by the ICAS 32 from the subscriber.

When the emergency contact service is initially

20 set up, the family designates a family telephone number and a master PIN. The master PIN is used to determine who has authority to add/delete family members to/from, emergency contact information table 72, 72'. Separate PINs may be assigned to different members of the family

25 to help distinguish family members and to determine the authority to update the information corresponding to a particular family member. These separate PINs can be limited to allow access for adding/changing contact phone numbers and contact messages for particular family

members, but not others. In such an implementation, the
master PIN may be kept secret for parental control
purposes.

5   The PINs, as will be discussed below, also
allow authorized family members to use the emergency
contact service of the present invention when calling
from locations/telephones other than the ones listed in
the emergency contact information table 72'. In step
10   220, the subscriber is prompted for the family telephone
number and/or the PIN. The subscriber may be listed in
one or more emergency information tables 72'. The family
telephone number is used to identify the specific table
to be accessed since different tables have different
15   family telephone numbers associated therewith. The PIN
is used to determine the level of access the subscriber
is to be given to edit the identified table's
information. Operation proceeds from step 220 to step
225 via connecting node 222.

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          In step 225, the family telephone number and/or
PIN 224 is received from the subscriber. In decision
step 226, a determination is made as to whether or not
the family telephone number and/or PIN received from the
25   subscriber is correct. If the family telephone number
and/or PIN is not correct the method 200, proceeds to
step 244 and stops. Prior to stopping, in some
embodiments, the subscriber is returned one or more times

to step 220, and presented the chance to enter accurate information.

In step 226, if the family telephone number and/or PIN received from the subscriber is determined to be correct, the method 200 proceeds to step 228. In step 228, the subscriber is presented with the emergency contact information table corresponding to the supplied family telephone number. An exemplary emergency contact information table 72' is illustrated in Fig. 5.

Exemplary table 72' includes the family telephone number 502, e.g., (732)555-1234. The table 500 also includes a first column 504 that lists members of a family, e.g., the Smith family, a second column 506 that lists telephone numbers from which the family members are likely to call, a third column 508 that lists contact telephone numbers, a forth column 510 that indicates if there is a stored voice or text message (570, 572, 574), a fifth column 512 that lists the E-mail address of the family member, if any, and a sixth column 514 that indicates if the family member listed in the corresponding row would like E-mail notifications when updates are made to the table 72'. A seventh column 515 is used to store the PIN associated with the listed service subscriber, while block 503 is used to store the master PIN for the Smith family 72'. The PINs may be stored and displayed in encrypted form for security purposes.

In table 72' each row of information 530, 540, 550, 560 corresponds to a different family member. Row 530 includes exemplary information for John Smith. Col.

5 560 indicates that land line number (732)555-1235 is a telephone number from which John Smith may call. Mobile telephone number information is not provided for John. In accordance with the present invention John Smith can enter one or more telephone numbers, e.g., up to three,

10 which can be used to contact him, e.g., in an emergency. The contact numbers will be tried, when establishing a conference call, in the order listed. The exemplary table includes a text message 570 which was left by John. John's email address, listed in col. 512, is

15 john@www.com, and he indicated that he would like E-mail notifications when there is an update to the table.

Row 540 includes exemplary information for Joan Smith, e.g., the mother of the Smith family. Land line

20 number (732)555-1235, and mobile number (732)555-9874 are telephone numbers associated with Joan from which she may call. Joan Smith entered two contact telephone numbers 1: (732) 555-6851 and 2: (732) 555-9874. She left a voice message 572, her email address is joan@www.com, and

25 she indicated that she would not like E-mail notifications when there is an update to the table.

Row 550 includes exemplary information for Adam Smith, e.g., a child in the Smith family. Land line

number (732)555-5612, and mobile number (732)555-3214 are telephone numbers associated with Adam from which he may call. Adam Smith entered one contact telephone number (732) 555-4387. He left a text message 574, his email

5   address is adam@www.com, and he indicated that he would like E-mail notifications when there is an update to the table.

Finally, row 560 includes exemplary information
10   for Jacob Barns, who is a close family friend of the Smith family and, for purposes of the service is treated as a family member. Land line telephone number (732)555-5931 is a telephone number from which he may call. Jacob has not entered a contact number, a message, or an
15   email address. As a result he will not receive E-mail notifications when there is an update to the table or be contacted when an emergency occurs. Jacob Barns may update the information in the table 72' at any time thereby allowing him to be contacted during an emergency.

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Returning to step 228 of Fig. 2, after entry of telephone number and PIN is verified, the table 72' corresponding to the entered family telephone number is retrieved and presented to the service subscriber. This
25   may involve transmitting the table to the subscriber's computer and displaying it thereon. The subscriber's ability to modify the table's content is determined based on which PIN was entered. The subscriber can add and/or update the subscriber's calling phone numbers 506,

contact phone numbers 508, a message 510, E-mail address
512 and E-mail notification 514 status. In addition, the
subscriber can read text messages left by other family
members 570, 574, or the subscriber can listen to voice

5   message 572. If the master PIN was entered the
subscriber may also add/delete members from the table
72'. In the context of the example being discussed the
term subscriber refers to individual or party listed as a
family member in the ECIT 72, 72'.

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        In step 232, updated table information 230 is
received from the subscriber. In step 234, the
information received from the subscriber is updated to
the extent the changes are permitted based on the

15 received PIN. The update process involves sending the
updated information to the various locations where it is
stored, e.g., in IP 10 and SCP 64. After the stored
tables 72, 72' are updated, operation proceeds to step
236. In step 236 a determination is made as to whether

20 or not a new emergency contact number and/or contact
message has been entered. If no new emergency contact
number or contact message was entered, operation proceeds
to step 244 wherein the update routine stops, e.g.,
pending the receipt of new information.

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        If a new emergency contact number and/or
contact message was entered, operation proceeds from step
236 to decision step 238. In step 238, the E-mail
notification setting for family members other than the

one making the changes is checked. If a family member
other than the one making the changes has set the E-mail
notification to "yes", operation proceeds to step 242,
otherwise it proceeds directly to stop step 244.

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      In step 242, an E-mail including the updated
contact information is generated and transmitted to those
family members who indicated that they wanted E-mail
notifications. Then the method 200 stops in step 244.

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      Fig. 3, which comprises the combination of
Figs. 3A-3B, illustrates the steps of an exemplary method
300 for updating and/or checking emergency contact
information tables using a telephone and the intelligent
15 peripheral (IP) 10.

      Method 300, which may be performed by the IP
10, starts in step 302, e.g., with a subscriber calling
an "800" number designated for updating and/or checking
20 emergency contact information. As part of the update
process a subscriber calls the "800" number, and in step
304, an intelligent peripheral (IP) used in providing the
emergency contact service of the invention receives the
call. In step 306 the IP prompts the subscriber for
25 login information. This information may include, e.g., a
primary family telephone number and a PIN. As in the
Fig. 2 update method, the family telephone number is used
to identify the family contact information table while

the PIN is used to determine the caller's authority to access and/or modify the information.

As an alternative to a PIN, or in conjunction with a PIN, automatic number information identification (ANI) associated with the call to the IP 10, may be used to determine the caller's right to access and/or modify a particular -information table. Operation proceeds from step 306 to step 311 via connecting node 308.

In step 311, the IP 10 receives the input from the caller. The input 310 includes the family telephone number and, optionally, a PIN. In step 312, the received information is entered to determine if it matches the stored information, i.e., if the information is correct. If the family telephone number and/or PIN is not correct the method 300, proceeds to stop step 330 with the subscriber being denied access to the emergency contact information. In some embodiments, as an alternative to being immediately denied access, the caller may be returned to step 306 and prompted to enter the information, e.g., the family telephone number and/or PIN, again.

Returning to decision step 312, if the family telephone number and/or PIN received from the subscriber is determined to be correct, operation proceeds to step 314. In step 314, the subscriber is presented with the emergency contact information table 72' corresponding to

the received family telephone number. Since the
subscriber is connected to the IP 10 via a telephone, the
information included in the emergency contact information
table 72' is presented in an audio form, e.g., using text

5   to speech functionality supported by the IP 10. The
subscriber is presented, in step 314, with the
opportunity to listen to voice messages left by other
family members. Stored voice messages will be played
back in the family member's own voice while text messages

10 are converted from text to speech by the IP 10 using
known techniques. After being presented with all or a
portion of the emergency contact information the
subscriber is presented with the opportunity to update
the subscriber's message and various other information

15 fields to the extent authorized by the entered PIN or
received ANI information. For example, the caller can
update calling phone numbers 506, contact phone numbers
508, E-mail address 512, and E-mail notification status
information. These changes can be implemented via DTMF

20 and/or voice control. In order to support voice update
commands IP 10 includes a speech recognizer. To support
recording of messages IP 10 also includes a speech
recording device.

25   In step 316, updated table information 318 is
received from the subscriber. In step 320, the
information 318 received from the subscriber is used to
update the content of the emergency call forwarding table
72' stored in the IP 10. The IP 10 also transmits a copy

of the updated table to the SCP 64 thereby updating the table 72 stored at the SCP 64. Operation proceeds from update step 320 to decision step 322. In step 322 a determination is made as to whether or not a new

5 emergency contact number and/or contact message was entered by the caller. If no new emergency contact numbers and/or contact messages were added, operation proceeds from step 322 to step 330 where it stops.

10 In decision step 322, if it is determined that a new emergency contact number and/or contact message was entered, operation proceeds from step 322 to decision step 324. In step 324, the E-mail notification setting for family members other than the one making the changes

15 is checked. If a family member other than the one making the changes has set the E-mail notification to "yes", operation proceeds to step 326, otherwise it proceeds directly to stop step 330.

20 In step 326 the new voice message(s), if any, are converted into a text form and an E-mail message is generated, e.g., using VXML. In various embodiments the E-mail message also includes the updated contact number(s) entered by the caller. In step 328, the

25 e-mail, including the updated contact information, is transmitted to those family members, other than the caller, who indicated that they wanted E-mail notifications. The method 300 then stops in step 330 pending the receipt of another call by the IP 10.

Fig. 4, which comprises the combination of
Figs. 4A-4C, illustrates the steps of an exemplary
emergency contact service method 400 of the present
invention. The method may be implemented by the system
100 shown in Fig. 1. Fig. 4 starts in Fig. 4A. The
method 400 starts in step 402 with a AIN trigger, e.g., a
terminating attempt trigger (TAT) being set on the family
telephone line, e.g., on the line corresponding to
telephone number (732)555-1234 in the case of the Fig. 5
example. The TAT 3, is set at the telephone switch to
which the family residence is coupled, e.g., telephone
switch 2 assuming the family residence is CP3 26.

Operation proceeds from start step 402 to step
404 wherein the AIN trigger, e.g., TAT 3, is activated at
the SSP 2 by a call to the family number. Next, in step
406, in response to activation of the TAT 3, the SSP 2
pauses the call, and then in step 408 the SSP 2 sends a
message, e.g., a TCAP message, to the SCP 64. In step
410, the SCP 64 accesses a Call Processing Record (CPR)
73 using the called party number, i.e., the family
telephone number, to identify the CPR 73 to be accessed.

Under control of information in the accessed
CPR 73, in step 412 the SCP 64 determines if the calling
party number, included in the received TCAP message, is
listed in the emergency contact information table 72 as a
number corresponding to a family member. If the calling

party number is listed, e.g., in Col. 506 of the Fig. 5
example, method 400 proceeds to step 416 otherwise
operation proceeds to step 418. In both steps 416 and 418
the SCP 64 generates a message which is used to control
5   call processing by the SSP 2.

        In step 416, which is encountered when a
calling party calls from a phone corresponding to a
family member, a message is generated for the SSP 2 that
10   causes the call to be completed to the family telephone
number with a special ring and with a NEL T_busy,
T_no_answer and T_answer event notification set. The
special ring, e.g., any one of a plurality of distinctive
rings by the SSP 2, is used to indicate to the called
15   party that the call is from a listed family member. The
NEL information is used to cause the SSP 2 to provide
information back to SCP 64 regarding call completion.
Operation proceeds from step 416 to step 420.

20   In step 418, which is encountered when a
calling party telephone number is not listed in the
information table 72', the SCP 64 generates a message to
the SSP 2 with NEL setting information. The message
causes the SSP 2 to complete the call to the called
25   family number with a conventional ring. The setting of
the NEL causes the SSP 2 to provide call completion
information to the SCP 64. Operation proceeds from step
418 to step 420.

In step 420 the SCP 64 transmits the message generated in either step 416 or 418 to the SSP 2. Next, in step 422, the SSP 2 receives the message from the SCP 64 with instructions on how to proceed with the call.

5   Operation proceeds from step 422 to step 426 via connecting node 424.

In step 426, the SSP 2 completes the call to the called family telephone number while setting the NEL

10   functionality used to report call completion information to the SCP 64. If the calling number was listed in the emergency contact information table the SSP 2 causes the special ring used to indicate a call from a family member to be produced.

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In step 430 the SSP 2 determines the call completion status, e.g., the SSP 2 determines if the line was busy, if no one answered the phone or if the phone was answered. In step 432 the SSP 2 transmits the call

20   completion information to the SCP 64. The SCP 64 receives the transmitted call completion information in step 434 and then operation proceeds to step 436.

In step 436, the SCP 64 determines from the

25   received information whether the call rang, but went unanswered. If someone answered the phone or the line is busy, the method 400 proceeds from step 436 to step 428, where the call is allowed to terminate in a normal manner, e.g., with the called or calling party hanging

up. In some embodiments when the called party has call waiting, when the called line is busy the ISCP returns the Call to the SSP with a priority ring status assuming the calling party is determined to be a family member.

5   In such embodiments if the called party has call waiting they will receive a priority call waiting tone versus the normal call waiting tone. Once the call is allowed to terminate, the processing of the detected call stops in step 429. While the processing of the detected call

10 stops in step 429, the AIN trigger set at the SSP 2 remains active and may initiate processing of other calls to the family number at any time.

In step 436, if the SCP 64 determines that a no

15 answer indication was received from the SSP 2, operation proceeds to decision step 438. In decision step 438, the SCP 64 determines from the calling party number if the calling party is listed in the emergency contact information table associated with the family, e.g., by

20 comparing the calling party number to the telephone numbers listed in the second col. 506 of the table 72. If the calling party number is listed, the method 400 proceeds directly to step 448. However, if the calling party number is not listed in the emergency contact

25 information table 72, the method 400 proceeds from step 438 to step 440.

In step 440, the SCP 64 sends a message to the SSP 2, instructing the SSP to connect the call to the IP

10 and to have the IP 10 play a first message, identified
as message 1, e.g., "please hold to be connected to voice
mail". At this point of the method 400, if the caller is
a family member, calling from a telephone which is not in
5   the table 72, has the option of entering a PIN, thereby
indicating the caller's status as a family member. In
step 442, the IP 10 collects any entered information from
the caller, e.g., digits of a PIN. In step 444, the IP
10 returns the call and any collected information to the
10   SCP 64. Operation then proceeds to decision step 446,
wherein the SCP 64 determines if a valid PIN was
received. If received input does not match a valid PIN
or no PIN was received, processing proceeds to step 447
wherein the SCP 64 instructs the SSP 2 to connect the
15   call to the voice mail IP 31 so that the caller can leave
a message if desired. Then in step 449 the SSP 2
connects the call to the voice mail IP 30. After the
call is connected to the IP 30, it is allowed to
terminate in the usual manner in step 428.

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       If in step 446 the SCP 64 determines that a
valid PIN was received from the caller, the method 400
proceeds to step 448. In step 448, the SCP 64 transmits
a message to the SSP 2 instructing the SSP 2 to reconnect
25   the call to the IP 10 and for the IP 10 to play a second
message, identified as message 2, to the caller.
Operation proceeds from step 448 to step 452 via
connecting node 450.

In step 452, the IP 10 plays Message 2 to the caller. Message 2 is a message that provides a list of the individuals who have provided emergency contact numbers. At this point, stored messages corresponding to

5 the individuals who left contact numbers may also be played to the caller. In some embodiments, individuals leaving messages can designate those messages as being for specifically identified family members. In such an embodiment, messages left for specific family members are

10 played if the entered PIN or calling party number corresponds to the person for whom the specific message was left. In step 454, the IP 10 prompts the calling party to select individuals or all of the members on the list of people who left contact numbers whom the caller

15 would like to include in a conference call.

In step 458, the IP 10 receives the conference call selection information 456 from the caller. Then, in step 460 the IP 10 places calls to each of the selected

20 parties, e.g., by supplying the contact numbers submitted by the selected family members to the SSP 2 as dialed digits. Upon a selected party answering a call placed by the IP 10, method 400 proceeds to step 462 wherein the IP 10 bridges the call between the calling party and the

25 answering party. As each called family member answers, the IP 10 adds the additional answering party to the conference call initiated by the first bridging operation. In this manner, the IP 10 can bridge in each called family member to establish a conference call

between two, three or even more family members located at
distinct locations. In step 464, the IP 10 detects when
all the parties included in the conference call have hung
up, terminating the conference call. Operation then

5   proceeds to step 466, wherein the conference call is
billed to the primary family phone number, e.g., as a
function of the number of conference call participants
and the duration of the conference call.

10   In one particular exemplary embodiment, billing
of the conference call is achieved as follows. At the
end of the call, the IP 10 calls the original called
number, which his a TAT that causes call processing to be
paused and a message to be sent to the SCP 65. In such

15   an embodiment, he SCP 64 recognizes the calling number as
being from the IP 10. When ISCP opens the CPR it looks
in the billing field to determine the number of parties
in the conference call and the duration of the call.
This information is placed into these fields at the time

20   the IP 10 initiates the billing call to the called
number, e.g., family telephone number. The SCP 64 then
sends an AMAslpID to the SSP with the billing information
causing the conference call to be billed to the original
called party. The SCP 64 then disconnects the connection

25   with the IP 10, e.g., terminates the billing call. With
the conference call completed and billed, processing of
the unanswered call, which resulted in the conference,
stops in step 468.

The present invention is not limited to times of national and family emergencies. It may be used for general purposes. For example, if a family member has to unexpectedly leave the house, they can use the present
5   invention and leave a message explaining their whereabouts and providing contact forwarding numbers. In addition, children who leave the home to visit friends can use the service as a way of providing their parents with a message and a contact number, which the parents
10   can access from a phone or even the Internet from a remote location.

While described in the context of an AIN system, the methods of the present invention can be
15   implemented using a wide range of telephony devices, and, as IP telephony grows, may even be implemented in an IP based communications system. In addition, as an alternative to an AIN based implementation the communications service may be implemented using a PBX
20   system which may include, or be coupled to, telephone conferencing circuitry.

While the communications service has been generally described as an emergency contact service for
25   family members, in one embodiment the service is used to provide a caller placing a call to an unanswered telephone number with a list of individuals who may be selected for conferencing. The calling party is then provided with the opportunity to select one or more

individuals from the list and to have a conference call automatically initiated with the selected individual or individuals. Such a service is useful in, among other things, business applications where a manager may want

5   callers to be presented with a list of alternative individuals who may handle an incoming call in the manager's absence.

Numerous variations on the above described

10 methods and apparatus are possible without departing from the scope of the invention.